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NOTES ON GEOGRAPHIC DISTRIBUTION

Reptilia, Squamata, Serpentes, Dipsadidae, *Pseudoeryx plicatilis* (Linnaeus, 1758): New records and geographic distribution map

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ABSTRACT: We reviewed the geographical distribution of *Pseudoeryx plicatilis* in South America, and present new records in Bolivia and from nine Brazilian states. This is the first record of *P. plicatilis* in the states of Acre, Amapá, and Roraima, northern region of Brazil. The presence of *P. plicatilis* in the municipality of Alta Floresta expands its distribution about 650-700 km northward in the state of Mato Grosso, and about 620 km southward from the nearest localities in the state of Pará. Other new records are presented, which contribute to the knowledge of the distribution of *P. plicatilis* in South America.

Pseudoeryx (Fitzinger, 1826) is a large aquatic dipsadid snake (attain 1,270 mm in snout-vent length) belonging to the subfamily Xenodontinae, tribe Hydropsini. The tribe includes two other genera: *Hydrops* (Wagler, 1830) and *Helicops* (Wagler, 1830) (Zaher 1999). The genus currently contains two species: *Pseudoeryx plicatilis* (Linnaeus, 1758) and *P. relictualis*, being the last one a recently described species endemic to the Maracaibo Lake basin, Venezuela (Schargel *et al.* 2007). *Pseudoeryx plicatilis* has previously been reported to occur in many countries of South America from Guyana region to Argentina (*e.g.* Hoge and Nina 1964; Williams and Fugler 1968; Cunha and Nascimento 1978; 1993; Gasc and Rodrigues 1980; Hoogmoed 1982; Pérez-Santos and Moreno 1988; Strüssmann and Sazima 1993; Carrillo de Espinoza and Icochea 1995; Silva Jr and Sites Jr 1995; Carvalho and Nogueira 1998; Giraudo 1999; Kornacker 1999; Frota *et al.* 2005; Marques *et al.* 2005; Schargel *et al.* 2007). However, most of these records do not define accurate localities, referring to the distribution of *P. plicatilis* in regional or national lists of species (*e.g.* Gasc and Rodrigues 1980; Hoogmoed 1982; Pérez-Santos and Moreno 1988; Kornacker 1999). Additionally, voucher specimens are provided only in Hoge and Nina (1964), Williams and Fugler (1968), Cunha and Nascimento (1993), Giraudo (1999), Frota *et al.* (2005), Marques *et al.* (2005), and Schargel *et al.* (2007).

Although this species is not registered on regional or national lists of threatened species in Brazil, information concerning geographic distribution, as well as natural history and taxonomy, are fundamental for determining the levels of threat of snakes and for establishing conservation strategies for such species (França and Araújo 2006; Martins and Molina 2008). Here we reviewed the geographical distribution of *P. plicatilis* in South America (based on Brazilian collections). New records in Bolivia and from nine Brazilian states are presented.

The geographic distribution of *P. plicatilis* was described by checking preserved specimens (see appendix) from the collections of Instituto Butantan (IBSP; São Paulo), Instituto Nacional de Pesquisas da Amazônia (INPA; Manaus), Museu de Ciências e Tecnologia da PUC-RS (MCP; Porto Alegre), Museu de História Natural Capão da Imbuia (MHNCI; Curitiba), Museu Paraense Emílio Goeldi (MPEG; Belém), Museu de Zoologia da Universidade de São Paulo (MZUSP; São Paulo), Coleção Herpetológica da Universidade Federal de Mato Grosso (UFMT; Cuiabá), and Coleção Zoológica de Referência do Campus de Corumbá da Universidade Federal do Mato Grosso do Sul (CEUCH; Corumbá). Literature records with precise localities are also included in the map (Figure 1).

This is the first record of *P. plicatilis* in the states of Acre, Amapá, and Roraima, in the northern region of Brazil (Figure 1). The presence of this species in the municipalities of Mâncio Lima and Porto Walter (Acre), near to the upper stretch of the Juruá River, expands its previous distribution about 450 km southward (see Carrillo de Espinoza and Icochea 1995; Silva Jr and Sites Jr 1995). The occurrence of this species in the Macapá and Mazagão municipalities (Amapá), near to the lower stretch of the Amazonas River and Marajó Island, expands its previous distribution about 340 km westward from the nearest localities in the state of Pará (see Cunha and Nascimento 1978; 1993). The presence of *P. plicatilis* in Boa Vista (Roraima), near to the upper stretch of the Branco River, expands its previous distribution about 550 km northward (see Silva Jr and Sites Jr 1995).

We present voucher specimens for *P. plicatilis* in the state of Rondônia (municipalities of Costa Marques and Espigão d'Oeste). Hoge and Nina (1964) once reported the presence of this species to Rondônia, for the locality "Mutun-Paraná, Rio Nadim", however the authors do not provided voucher number.

We also confirmed the occurrence of *P. plicatilis* in the state of Maranhão, northeastern region of Brazil. Cunha and Nascimento (1993) indicated that this species occurs in Maranhão, but they did not provide specific locality

or voucher number. The presence of *P. plicatilis* in the municipalities of Arari and Mirinzal, the easternmost points in the state (about 250 km west of the Parnaíba River, on the border between the states of Maranhão and Ceará), expands its previous distribution about 330 km eastward (see Cunha and Nascimento 1978; 1993).

The presence of *P. plicatilis* in the municipality of Alta Floresta, near to the upper stretch of the Teles Pires River, expands its distribution about 650 to 700 km northward in the state of Mato Grosso (see Strüssmann and Sazima 1993; Carvalho and Nogueira 1998; Marques *et al.* 2005), and about 620 km southward from the nearest localities in the state of Pará (see Hoge and Nina 1964).

Pseudoeryx plicatilis has been mentioned to occur in Bolivia (Kornacker 1999), but the author did not provide specific locality or voucher number. Here we present a voucher specimen to eastern Bolivia (municipality of San Ignacio de Velasco). This record expands its distribution

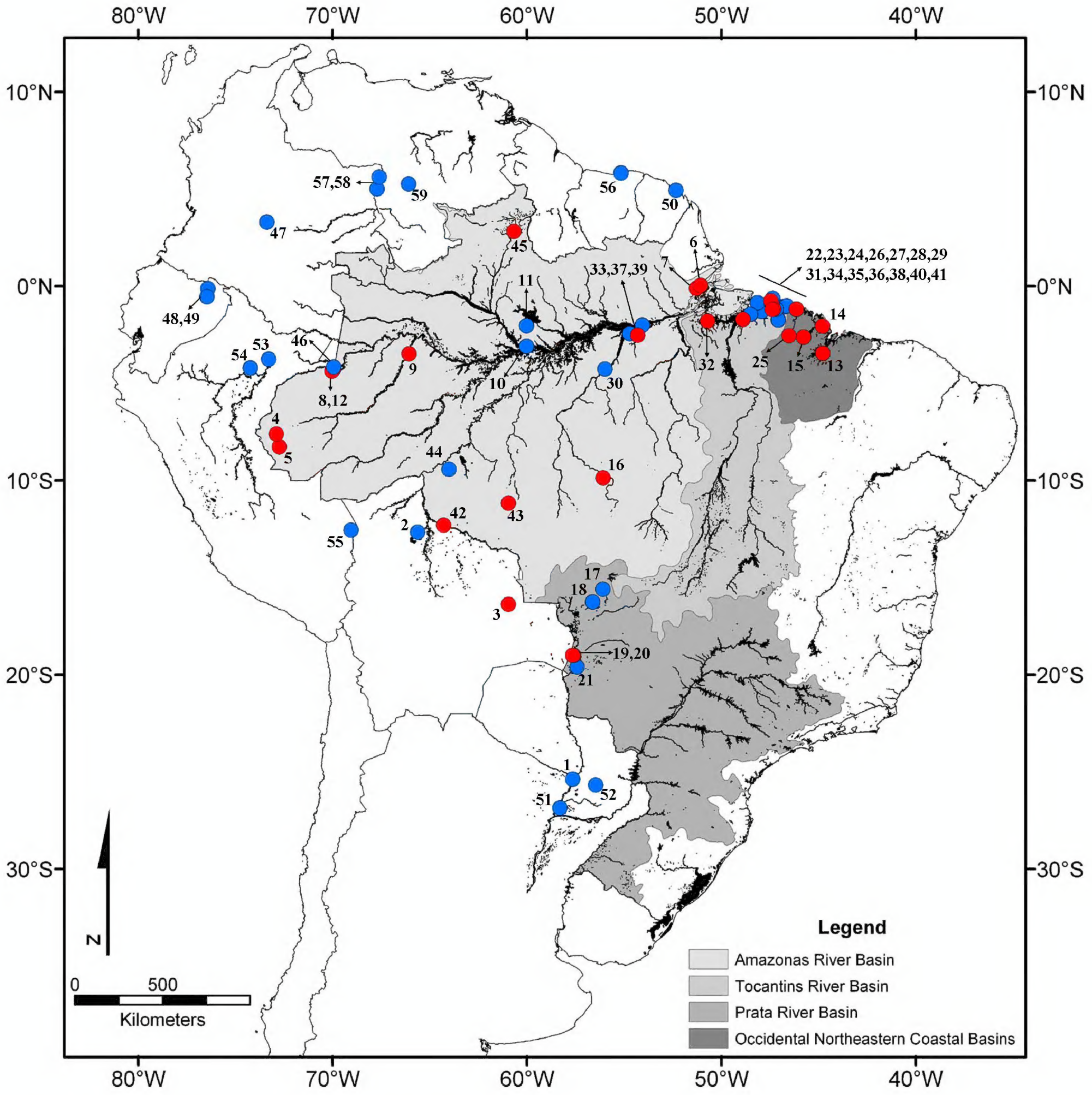

Figure 1. Geographical distribution of *Pseudoeryx plicatilis* in South America along the major river basins. Red dots = new localities with records of *P. plicatilis*. Blue dots = previous records from literature (Hoge and Nina 1964; Williams and Fugler 1968; Cunha and Nascimento 1978; 1993; Strüssmann and Sazima 1993; Carrillo de Espinoza and Icochea 1995; Silva Jr and Sites Jr 1995; Carvalho and Nogueira 1998; Giraudo 1999; Frota *et al.* 2005; Marques *et al.* 2005; Schargel *et al.* 2007). **Argentina**. Formosa: Pilcomayo[1]; **Bolívia**. El Beni: Mamoré River[2]; Santa Cruz: San Ignacio de Velasco[3]; **Brazil**. Acre: Mâncio Lima[4], Porto Walter[5]; Amapá: Macapá[6], Mazagão[7]; Amazonas: Benjamin Constant[8], Juruá[9], Manaus[10], Balbina, Presidente Figueiredo[11], Tabatinga[12]; Maranhão: Arari[13], Mirinzal[14], Paruá, Santa Luzia do Paruá[15]; Mato Grosso: Alta Floresta[16], Cuiabá[17], Poconé[18]; Mato Grosso do Sul: Corumbá[19], Ladário[20], Porto Esperança, Corumbá[21]; Pará: Augusto Corrêa[22], Belém[23], Bragança[24], Gurupi River, Canindé[25], Capanema[26], Capitão Poço[27], Castanhal[28], Igarapé-Açu[29], Itaituba[30], Maracanã[31], Melgaço[32], Monte Alegre[33], Nova Timboteua[34], Peixe-Boi[35], Salinópolis[36], Santarém[37], Santarém Novo[38], Taperinha, Santarém[39], Vigia[40], Viseu[41]; Rondônia: Costa Marques[42], Espigão d'Oeste[43], Mutum-Paraná, Nadim River[44]; Roraima: Boa Vista[45]; **Colombia**. Amazonas: Leticia[46]; Meta: Lomalinda[47]; **Ecuador**. Napo: Limon Cocha[48]; Sucumbios: Tarapoa[49]; **French Guiana**: Caiena[50]; **Paraguay**. Ñeembucú: Pilar[51], Yatayty[52]; **Peru**. Loreto: Iquitos[53], Loreto[54]; Madre de Dios: Puerto Maldonado[55]; **Suriname**: Paramaribo[56]; **Venezuela**. Amazonas: Pendare[57], Puerto Ayacucho[58], San Juan de Manapiare[59].

about 650 km eastward in Bolivia (Mamoré River; Cope 1885, *apud* Hoge and Nina 1964), and about 500 km westward from the nearest localities in Brazil (see Hoge and Nina 1964).

In summary, *P. plicatilis* is widely distributed in Tropical South America, along the major river basins (see Figure 1). This species occurs to the east of the Andean, in the northern region of the Amazonian rainforest (*e.g.* Orinoco River basin and Guyana region), along the Amazonas River basin and its major tributaries (*e.g.* Juruá, Madeira, and Tapajós) to the east of the state of Pará and west of the state of Maranhão (in the occidental northeastern coastal basins). *Pseudoeryx plicatilis* also occurs along the Prata River basin (restrict to the Paraguay River basin), in the states of Mato Grosso and Mato Grosso do Sul in Brazil (in flooded areas of the Pantanal region), to the east of Bolivia, north of Argentina, and southwestern Paraguay (Humid Chaco region) (Hoge and Nina 1964; Williams and Fugler 1968; Cunha and Nascimento 1978; 1993; Hoogmoed 1982; Strüssmann and Sazima 1993; Carrillo de Espinoza and Icochea 1995; Silva Jr and Sites Jr 1995; Carvalho and Nogueira 1998; Giraudo 1999; Frota *et al.* 2005; Marques *et al.* 2005; Schargel *et al.* 2007; present study).

Additionally, *P. plicatilis* may be sympatric with *Hydrops martii*, *H. triangularis*, and *Helicops* spp. along the Amazonas River basin, east of Pará and west of Maranhão (see Cunha and Nascimento 1978; 1993; Frota *et al.* 2005), and with *Hydrops caesurus* and *Helicops leopardinus* (and possibly *H. polylepis* and *H. angulatus*; RRS unpublished data) along the Paraguay River basin and Pantanal region (Scrocchi *et al.* 2005; Ávila *et al.* 2006). Nothing is known about the microhabitat used by *P. plicatilis*, but this species may occur in permanent and temporary aquatic habitats, both in forested and open areas (see Cunha and Nascimento 1978; 1993; Ávila *et al.* 2006).

Nowadays, two subspecies of *Pseudoeryx plicatilis* are recognized: *P. p. plicatilis* and *P. p. mimeticus* (see Hoge and Nina 1964). These subspecies are inter-graded in some regions in Brazil and the differentiation of the two forms is not clear in many taxonomic and geographic aspects (Hoge and Nina 1964; Cunha and Nascimento 1978; 1993). Thus, future works covering taxonomic and molecular attributes of different populations of *P. plicatilis* along its distribution certainly will provide subsidies for more specific studies (*e.g.* biogeography).

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Literature Cited

Ávila, R.W., V.L. Ferreira, and J.A.O. Arruda. 2006. Natural history of the South American water snake *Helicops leopardinus* (Colubridae: Hydropsini) in the Pantanal, Central Brasil. *Journal of Herpetology* 40: 274-279.

Carrillo de Espinoza, N. and J. Icochea. 1995. Lista taxonomica preliminar de los reptiles viventes del Peru. *Publicaciones del Museo de Historia Natural de la Universidad Nacional Mayor de San Marcos* (A) 49: 1-27.

Carvalho, M.A. and F. Nogueira. 1998. Serpentes da área urbana de Cuiabá, Mato Grosso: aspectos ecológicos e acidentes ofídicos associados. *Cadernos de Saúde Pública* 14: 753-763.

Cunha, O.R. and F.P. Nascimento. 1978. Ofídios da Amazônia X: as cobras da região Leste do Pará. *Publicações Avulsas do Museu Paraense Emílio Goeldi* 31: 1-218.

Cunha, O.R. and F.P. Nascimento. 1993. Ofídios da Amazônia. As cobras da região Leste do Pará. *Boletim do Museu Paraense Emílio Goeldi, série Zoologia* 9: 1-191.

França, F.G.R. and A.F.B. Araújo. 2006. The conservation status of snakes in Central Brazil. *South American Journal of Herpetology* 1: 25-36.

Frota, J.G., A.P. Santos Jr., H.M. Chalkidis and A.G. Guedes. 2005. As serpentes da região do baixo Rio Amazonas, oeste do Estado do Pará, Brasil (Squamata). *Biociências* 13: 211-220.

Gasc, J.P. and M.T. Rodrigues. 1980. Liste préliminaire des Serpents de la Guyane Française. *Bulletin du Muséum National d'Histoire Naturelle* 2: 559-598.

Giraudo, A.R. 1999. New records of snakes from Argentina. *Herpetological Review* 30: 179-181.

Hoge, A.R. and A.C.M. Nina. 1964. Serpentes coletadas pelo Instituto Nacional de Pesquisas da Amazônia. *Memórias do Instituto Butantan* 30: 71-96.

Hoogmoed, M.S. 1982. Snakes of the Guianan region. *Memórias do Instituto Butantan* 46: 219-254.

Kornacker, P.M. 1999. *Checklist and key to the snakes of Venezuela*. Rheinbach: Pako-Verlag. 270 p.

Marques, O.A.V., A. Eterovic, C. Strüssmann and I. Sazima. 2005. *Serpentes do Pantanal. Guia ilustrado*. Ribeirão Preto: Holos. 179 p.

Martins, M. and F.B. Molina. 2008. Panorama geral dos répteis ameaçados do Brasil, v. 2; p. 327-334 *In* A. Machado, G. M. Drummond and A. P. Paglia (orgs.). *Livro Vermelho da fauna brasileira ameaçada de extinção*. Brasília/Belo Horizonte: Ministério do Meio Ambiente/ Fundação Biodiversitas.

Pérez-Santos, C. and A.G. Moreno. 1988. *Monografie VI. Ofidios de Colômbia*. Torino: Museu Regionale di Scienze Naturali. 517 p.

Schargel, W.E., G.R. Fuenmayor, T.R. Barros, J.E. Péfaur and L.F. Navarrete. 2007. A new aquatic snake (Colubridae, *Pseudoeryx*) from the Lake Maracaibo Basin, northwestern Venezuela: a relict of the past course of the Orinoco River. *Herpetologica* 63: 236-244.

Scrocchi, G.J., V.L. Ferreira, A.R. Giraudo, R.W. Ávila and M. Motte. 2005. A new species of *Hydrops* (Serpentes: Colubridae: Hydropsini) from Argentina, Brazil and Paraguay. *Herpetologica* 61: 468-477.

Silva Jr., N.J. and J.W. Sites Jr. 1995. Patterns of diversity of Neotropical Squamate reptile species with emphasis on the brazilian Amazon and the conservation potential of indigenous reserves. *Conservation Biology* 9: 873-901.

Strüssmann, C. and I. Sazima. 1993. The assemblages of the Pantanal at Poconé western Brazil: faunal composition and ecology summary. *Studies on Neotropical Fauna and Environment* 28: 157-168.

Williams, K.L. and C.M. Fugler. 1968. An additional record of *Pseudoeryx plicatilis ecuadorensis* from Ecuador. *Journal of Herpetology* 1: 104-105.

Zaher, H. 1999. Hemipenial morphology of the South American Xenodontine snakes, with a proposal for a monophyletic Xenodontinae and a reappraisal of colubroid hemipenes. *Bulletin of the American Museum of Natural History* 240: 1-168.

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Appendix 1. Examined specimens.

Pseudoeryx plicatilis – **BOLIVIA: Santa Cruz:** San Ignacio de Velasco (16°22'32" S, 60°57'17" W, 408 m): IBSP 19749. **BRAZIL: Acre:** Mâncio Lima (07°36'51" S, 72°53'45" W, 195 m): MZUSP 8002; Porto Walter (08°16'07" S, 72°44'38" W, 195 m): MZUSP 7369; **Amapá:** Macapá (00°02'20" S, 51°03'59" W, 16.4 m): IBSP 24784, 24785, 26276; Mazagão (00°06'54" S, 51°17'22" W, 60 m): MPEG 91; **Amazonas:** Benjamin Constant (04°22'59" S, 70°01'52" W, 65 m): MZUSP 7200; Juruá (03°28'52" S, 66°04'08" W, 55 m): INPA 17233; Tabatinga (04°15'09" S, 69°56'17" W, 60 m): IBSP 42619; **Maranhão:** Arari (03°27'13" S, 44°46'48" W, 7.3 m): MPEG 13549, 14330, 14639, 15616; Mirinzal (02°03'54" S, 44°47'03" W, 31 m): IBSP 41069; Paruá, Santa Luzia do Paruá (02°30'02" S, 45°46'30" W, 0 m): MPEG 10267, 12812, 14354; **Mato Grosso:** Alta Floresta (09°52'32" S, 56°05'10" W, 283.6 m): IBSP 41329; Poconé (16°15'24" S, 56°37'22" W, 142 m): UFMT 38, 1769,

1772, 2009; **Mato Grosso do Sul:** Corumbá (19°00'33" S, 57°39'12" W, 118.7 m): CEUCH 160, 2095, UFMT 1398, 1402; Ladário (19°00'17" S, 57°36'06" W, 114 m): CEUCH 24, 25, 130, 457; **Pará:** Augusto Corrêa (01°01'18" S, 46°38'42" W, 20 m): MPEG 1796, 6689, 9944, 11642; Belém (01°27'21" S, 48°30'16" W, 10.8 m): IBSP 5090, MPEG 297, 10172, 16626, 16699, 17677, 17687, 18530, 18559, 18605; Bragança (01°03'48" S, 46°46'24" W, 19.5 m): MPEG 1947, 2250, 2481, 2993, 2995, 3622, 5070, 7836, 8287, 8300, 11412; Canindé, Rio Gurupi (02°33'00" S, 46°31'00" W, 59 m): MZUSP 4245; Capanema (01°11'45" S, 47°10'51" W, 24.4 m): MPEG 17296, 17672; Capitão Poço (01°44'41" S, 47°03'54" W, 73 m): MPEG 6083, 7262, 9614, 9620, 9686, 10459, 10460, 10493, 10501, 10631, 10640, 12164; Castanhal (01°17'48" S, 47°55'20" W, 41.4 m): MPEG 451, 1170, 2023, 4750, 8585, 10190; Igarapé-Açu (01°07'37" S, 47°37'06" W, 50 m): MPEG 865, 866; Maracanã (00°35'42" S, 47°34'55" W, 45 m): MPEG 2858; Melgaço (01°48'16" S, 50°42'44" W, 12 m): MPEG 19731, 20062; Monte Alegre (02°00'28" S, 54°04'09" W, 38 m): IBSP 40502; Nova Timboteua (01°12'21" S, 47°23'08" W, 51 m): MPEG 21740; Peixe-Boi (01°11'32" S, 47°18'50" W, 34 m): MPEG 1383, 1828, 19351; Santarém Novo (00°55'44" S, 47°23'49" W, 30 m): MPEG 4798; Taperinha, Santarém (02°31'55" S, 54°17'41" W, 2 m): MZUSP 4812; Vigia (00°51'30" S, 48°08'30" W, 6 m): MPEG 6903, 9285, 9304, 9306, 10558; Viseu (01°11'48" S, 46°08'24" W, 15 m): MPEG 1739, 2264, 4440, 7308, 10035, 10889, 11279, 12565, 15942, 15984, 16285, 16309; **Rondônia:** Costa Marques (12°24'56" S, 64°13'18" W, 156 m): MCP 6552; Espigão d'Oeste (11°31'30" S, 61°00'50" W, 272 m): MHNCI 10445; **Roraima:** Boa Vista (02°49'11" N, 60°40'24" W, 85.1 m): MZUSP 9769.